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FIRE MANAGEMENT NOTES

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FIRE MANAGEMENT NOTES

An international quarterly periodical devoted to forest fire management

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AIRLIFT!

The powerful CH-54A Skycrane helicopter (pictured on the cover) can help to alleviate problems of delivering heavy fire equipment to remote fires in rough terrain. Watch for more information in the next issue of *FIRE MANAGEMENT NOTES*.

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Earl L. Butz, Secretary of Agriculture

John R. McGuire, Chief, Forest Service

Henry W. DeBruin, Director, Division of Fire Management

J. O. Baker, Jr., Managing Editor

Computerized Fire Studies

Dick Rondeau

The Oregon Forestry Department has combined the information resource of 20 years of fire reports with the data-handling dexterity of the IBM 360 computer to provide the basis of local fire prevention planning.

Forest fire statistics and summaries were generally compiled principally by State or regional area. Local district summaries lacked detail because of difficulty in manually processing data. Prevention planning accepted these undetailed statistics when prevention programs were generated toward a "homogeneous" public through such media as "Keep Green" programs, county fair booths, and radio and television spots.

Present day fire prevention planners must look at specifics and direct prevention efforts to the kinds of fires which are causing the greatest amount of suppression costs and damages. Oregon has a wide range of climate, land uses, and population complexes. Because of these, fire causes differ in importance from District to District. Prevention planning, based on statewide fire occurrence data, has been inadequate in Oregon for a number of years.

The Prevention Section of the Oregon Forestry Department's Protection Division has developed a fire prevention policy, combining education and law enforcement, which is directed to

specific problem areas. Implementation of this program requires an analysis of the situation. Fire studies, developed from reports of previous fires, are a key analytical tool. A brief description of the Department's organization is given below to explain how the fire studies are compiled and maintained.

The Oregon Protection System

The Forestry Department protects approximately 16 million acres of forest and rangelands organized within 4 areas and 16 districts. Districts with very large organizations and Districts extending over large

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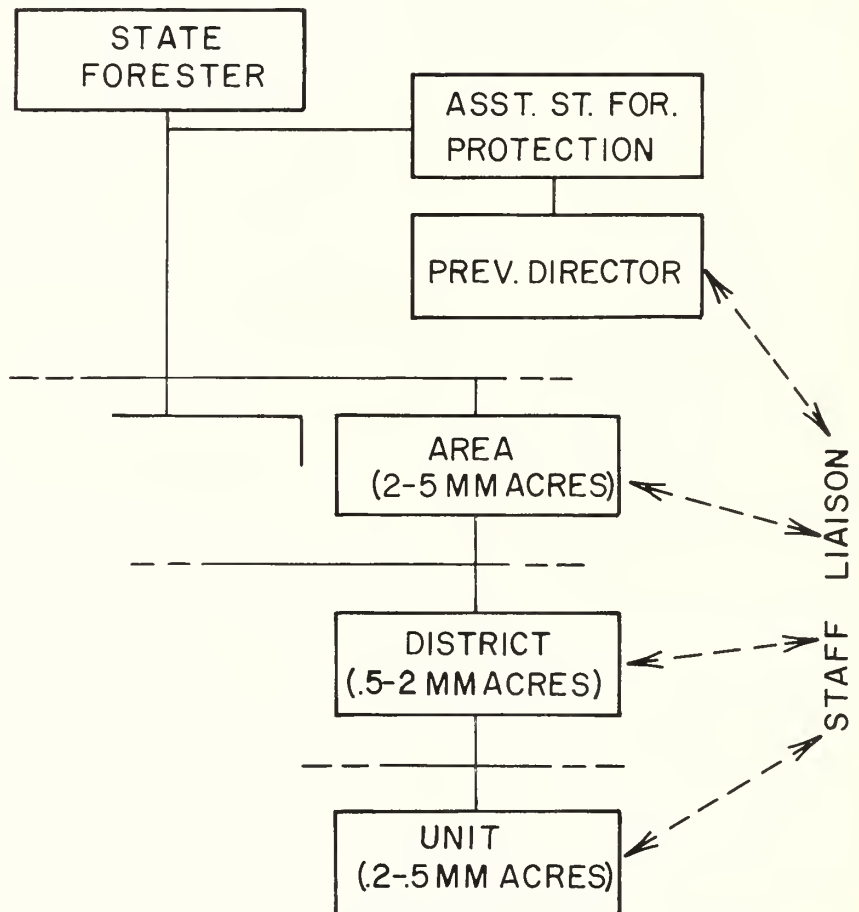


Figure 1.—Simplified organization of the Oregon Forestry Department

Mr. Rondeau is a member of the Plans, Studies, and Development Section of the Forest Protection Division, Oregon Forestry Department, Salem, Oregon.

COMPUTERIZED FIRE STUDIES

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geographic areas are divided into units averaging about 500,000 acres in size.

Basic responsibilities for prevention planning are held by the Unit Foresters with coordination at district, area, and State headquarters. The headquarters prevention director coordinates statewide programs, develops training programs, and serves as an information clearinghouse.

The entire State organization is becoming progressively more associated with cooperative prevention efforts on adjoining and intermingled federal forest lands.

The Data System

Individual fire reports are completed for each statistical fire. The coded data entries for the years since 1956 are stored on magnetic tape. Whenever changes in report format have taken place, the records for previous years have been translated and updated to maintain data compatibility for all years. The electronic data processing (EDP) data file was expanded in 1976 to include nonstatistical fires and nonfire crew actions.

The studies derived from the master report file are used for many purposes in addition to the prevention planning discussed here.

The Fire Studies

Various tables were constructed to display different combinations of fire report data. To date a total of 21 tables have been produced. These have been divided into nine groups, or "studies", of tables displaying similar information. Tables may be combined for unit, district, area, or statewide totals; and for any specified number of years within the 1956 to 1975 master file. As needs change new tables can be developed from data which are included in the EDP coding.

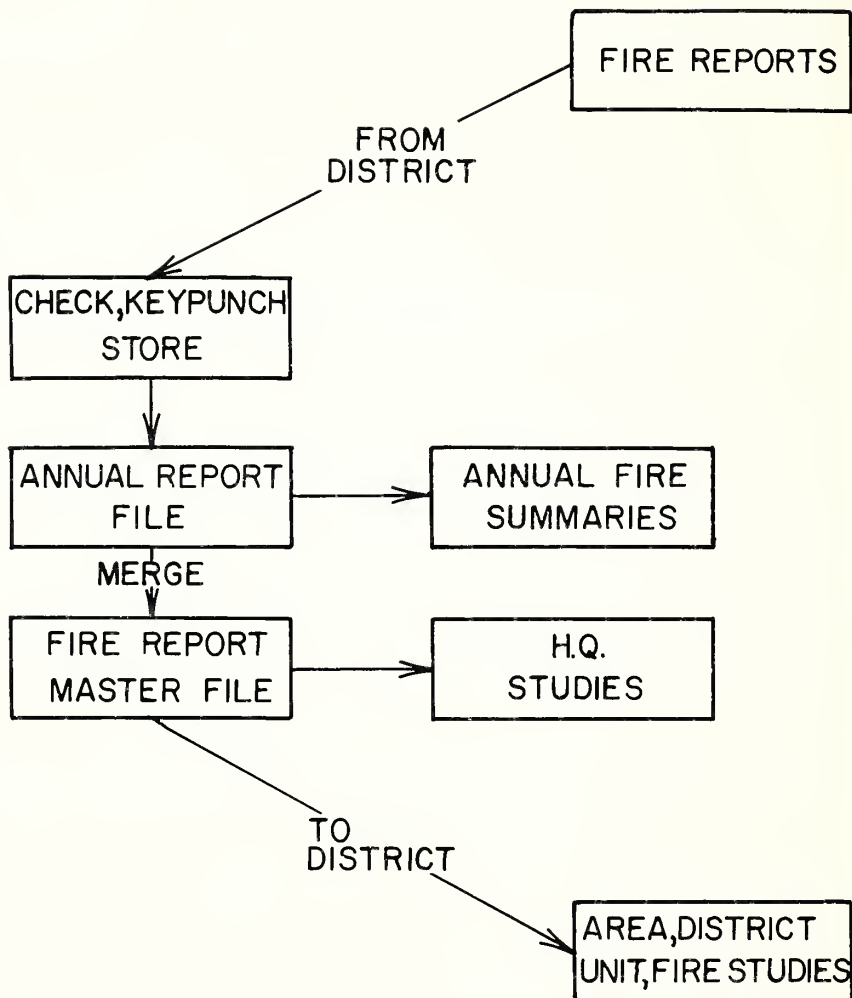


Figure 2.—Fire reporting system.

Quality Control

Fire data are vulnerable to the "garbage in—garbage out" syndrome. Importance of the data resource justifies extra quality control measures. Some of the activities or conditions we have found to be vital are:

1. Adequate information—Key fire report items for prevention planning must be identified and included in the EDP coding base.

2. Coordination—Uniformity of data reported must be maintained throughout the system. Printed instructions often provide insufficient control. Districts may tend to develop instruction interpretations which dig-

ress from original intent. Staff must conduct fire-reporting seminars at 1- or 2-year intervals with involved unit personnel to maintain uniformity.

3. Programming—Availability of a computer programmer acquainted with fire management people and informed on fire management objectives is a big asset. This speeds up the process and usually results in tabulations which fulfill field needs on the first attempt.

4. Data quality—Fire report errors are relatively common for several reasons. A combination of data verification and visual inspection is necessary to catch subjective errors.

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Man-Caused vs. Lightning-Caused Fires: A Geographic and Reporting Problem

William A. Main and
Donald A. Haines

In the Eastern United States almost all wildfires are caused by people, while in the Western United States lightning is the leading cause—right? Well, sort of. Along with other things in life, fire-cause classifications do not always fit a nice, simple pattern. To clarify some of the details of the problem, we summarized and analyzed Federal and State-private data, State by State, from tabulations provided in the publication, *Wildfire Statistics*, which is published annually by the Forest Service, U.S. Department of Agriculture. We used data for the years 1970 through 1974.

The analysis shows only two Eastern States, Maine and Florida, have 10 percent or more of the total number of wildfires caused by lightning; however, most of the lightning-caused fires in this country occur in the West (fig. 1). In only four States does lightning cause more than 50 percent of the wildfires each year.

Some interesting differences are revealed by further subdividing the information on lightning vs. man-caused fires by Federal vs. State-private protection areas. More than half of the fires occurring on Federal lands in 11 western States were

caused by lightning (fig. 2), while wildfires occurring on State- or private-protected lands in 10 of these same States were caused primarily by people (fig. 3). In many States the differences in percentages reported by Federal vs. State or private agencies are striking. For example, Federal agencies in California reported well over 50 percent of their fires as lightning caused while State-private California agencies reported only 6 percent. In Arizona, Federal agencies reported 76 percent as lightning caused while State-private groups re-

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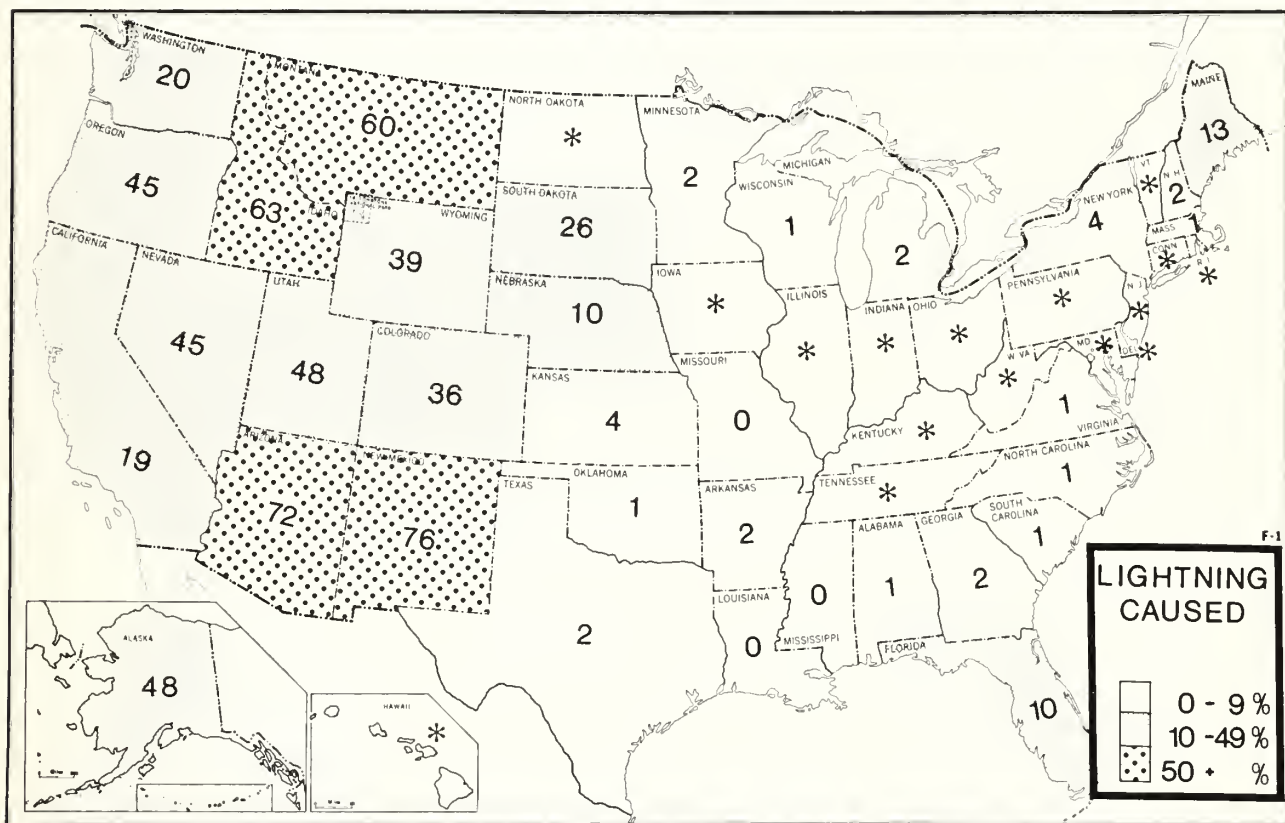


Figure 1.—Lightning fires as a percentage of wildfires reported by all protection agencies in each State. States that average under 10 lightning fires annually are starred.

MAN-CAUSED VS. LIGHTNING-CAUSED FIRES

from page 5

ported 22 percent. Throughout the United States, Federal agencies reported 58 percent of their fires as lightning caused while State-private agencies reported only 6 percent.

Reasons Varied

The reasons for these Federal vs. State-private agency differences are varied:

1. Type of land under protectorate/ownership accounts for much of the difference. Lightning strikes, which result in fire starts, occur with certain land features more often than with others, because of such meteorological factors as high-level or "dry" thunderstorms. Cloud bases are so high that precipitation may evaporate before reaching the ground; therefore, fuels remain dry and probability of ignition is good. These high-level thunderstorms favor the forested, mountainous West, and the elevation of much federally protected land makes it especially vulnerable.

2. There are also differences in these data, because some agencies do not report fires if no action is taken. Among the various reportable causes, lightning fires often fall in this category.

3. Finally, reporting methods are not standard among agencies. As an example, if one agency reports each lightning set as a separate fire in a given storm while another agency groups all sets under a single fire, confusing statistics result. This same type of problem develops when reporting incendiary fires. Some agencies may report a string of sets as one fire while others may report the situation as multistarts. Unfortunately, we still have not agreed upon a uniform definition of a reportable wildfire.

It is obvious then that statistics on man-caused vs. lightning-caused fires are not always comparable. Several factors account for this situation, with end results determined largely by ge-

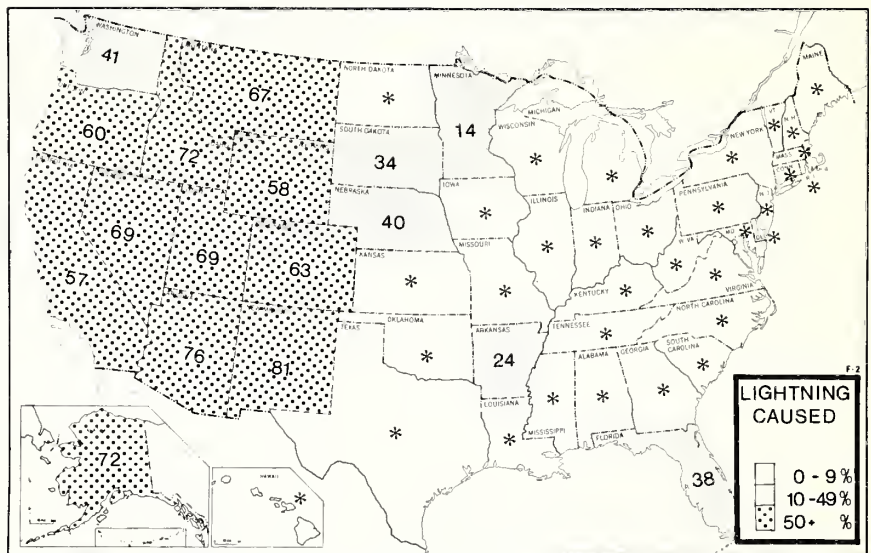


Figure 2.—Lightning fires as a percentage of wildfires reported by Federal protection agencies in each State.

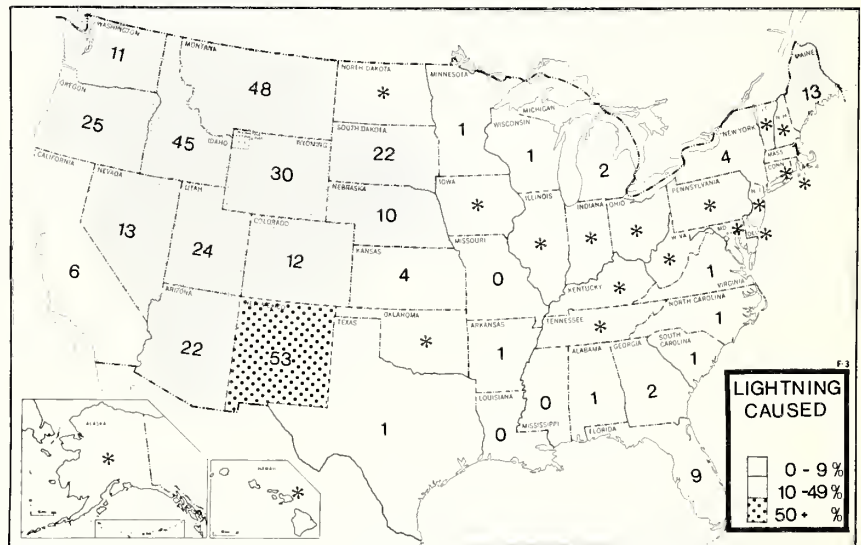


Figure 3.—Lightning fires as a percentage of wildfires reported by State-private protection agencies in each State.

ography and the reporting agency. This situation will continue until we arrive at standard reporting procedures and uniform definitions.



Mr. Main is a computer programmer and Mr. Haines is a principal research meteorologist for the North Central Forest Experiment Station in East Lansing, Michigan.



Drought and Fire in the Lake States

Von J. Johnson

"Those who cannot remember the past are condemned to repeat it." George Santaya—The Life of Reason

The dominant single harbinger of past disastrous fires in the Eastern United States is drought. Precipitation deficits over an extensive area for 3 to 8 months preceded nearly all historically prominent fires. This is particularly evident for late summer and early fall fires (Haines and Sando 1969).

The Palmer Drought Index, which accounts for the scope, duration, and frequency of abnormally wet or dry weather, is a measure of prolonged drought (U.S. Department of Agriculture 1976). The Index reached values of -3 and lower for the Peshtigo, Wisc., and Chicago fires of 1871. (Index levels of -3 to -4 signify severe drought.) Conditions during the 1894 Hinkley, Minn. fires showed a -9—a drought so extreme that it is not defined on the Palmer scale. Similar severe droughts persisted during the 1947 Bar Harbor and 1965 Centerville fires in Maine when the Index reached -3 to -4.5 (Haines et al. 1976).

In mid summer of 1976, an extreme drought occurred in the agricultural areas of northwestern Minnesota (fig. 1). One month later the drought had intensified over Minnesota and spread eastward, involving most of the forested area of northern Minnesota,

northern Wisconsin, and the Upper Peninsula of Michigan (fig. 2). For 3 more months drought conditions continued unabated (fig. 3, 4 and 5) and spread throughout Minnesota and Wisconsin, the northern half of Michigan, and southern Ontario. Thus, the increase in late summer fire activity, accompanying the severe drought, did not arrive unannounced!

The State of Minnesota imposed a ban on open burning in late May and stringent closure of all forest land on September 20. By the end of September, 2,500 fires had burned more than 120,000 acres—a two-fold increase over the previous 5-year average (table 1). More than 50 major structures were destroyed and 3 fire-threatened towns evacuated. Fires, burning as deep as 8 feet in peat bogs, thwarted suppression efforts. Unusual ignition sources, such as electric fences and exhausts from farm machinery, caused most of the larger fires. The increased activity continued throughout October.

Each year Michigan normally expects about 1,100 fires to burn 5,300 acres (table 1). By September 30, 1976, almost 1,200 fires had burned 23,853 acres, which exceeded 0.1 percent of protected area for the first time in almost 20 years. The incidences of lightning and incendiary fires were more than twice that of previous years. A single fire in the Upper Peninsula on the Seney National Wildlife Refuge (Walsh Ditch Fire) burned about 72,500 acres of Federal and State land. On August 25 the governor declared a state of fire emergency in the Upper Peninsula. Fires burning in bogs and lake-bed peat persisted well into November.

About 2,000 fires normally burn 6,000 acres of State and private land in Wisconsin (table 1). By September 30, 1976, more than 3,300 fires had burned more than 13,000 acres. More than 5,500 acres of pine plantation and 22 major structures were destroyed. Many fires burning deep in organic soil or peat required weeks to

Table 1.—Average size and annual number of fires (1970-74)¹

Protection Agency	Size	Number
Michigan	4.8	1106
Minnesota	48.3	1168
Wisconsin	3.1	2052
USDA Forest Service ²	13.8	381

Mr. Johnson is a principal fire control specialist, North Central Forest Experiment Station, USDA Forest Service, East Lansing, Mich.

¹USDA Forest Service. Wildfire Statistics and National Forests Fire Report; 1970, 1971, 1972, 1973, and 1974. Washington, D.C.

²Includes protected area for seven National Forests: Chequamegon, Chippewa, Huron-Manistee, Nicolet, Ottawa, Superior, and Hiawatha.

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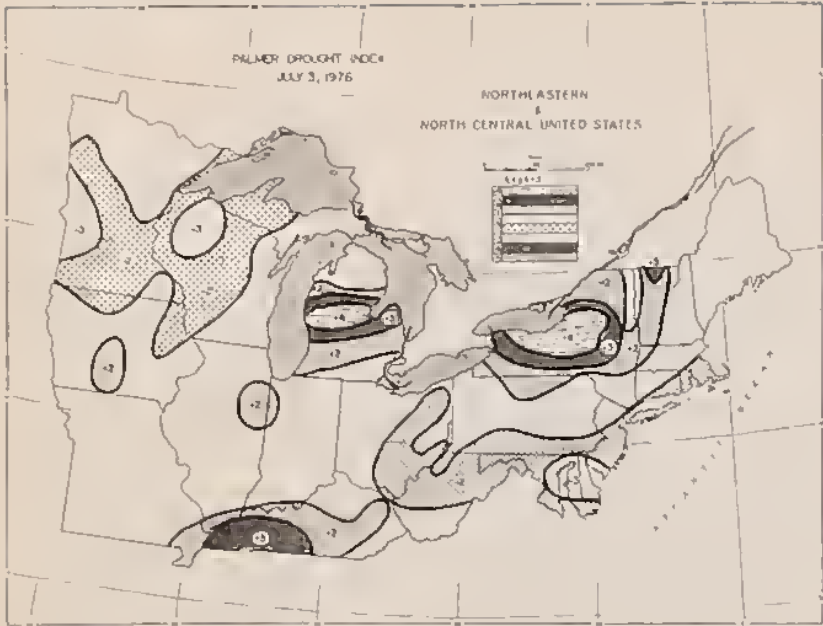


Figure 1

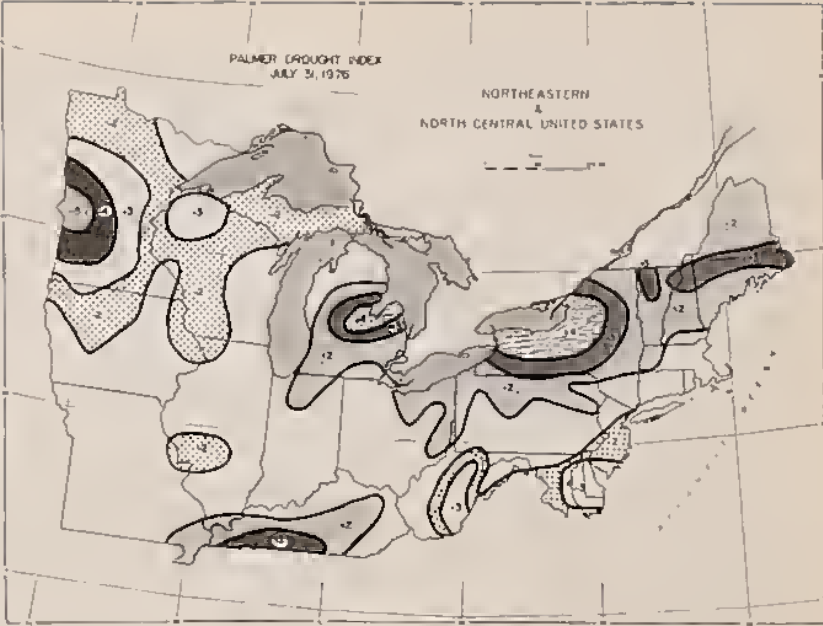


Figure 2

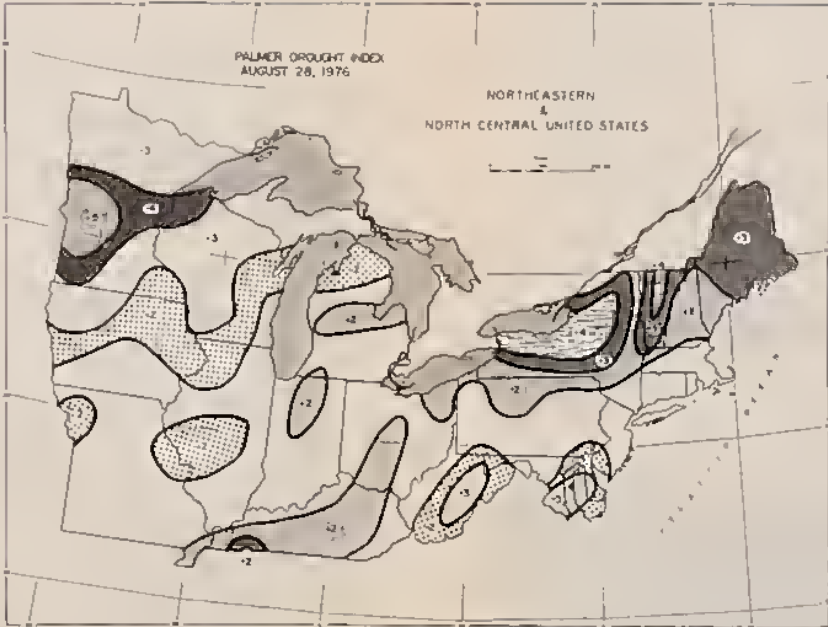


Figure 3

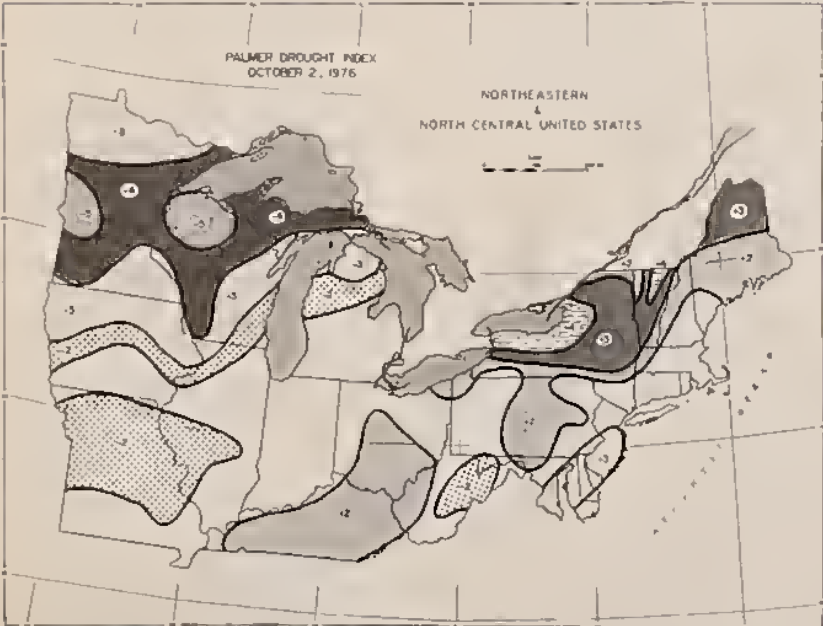


Figure 4

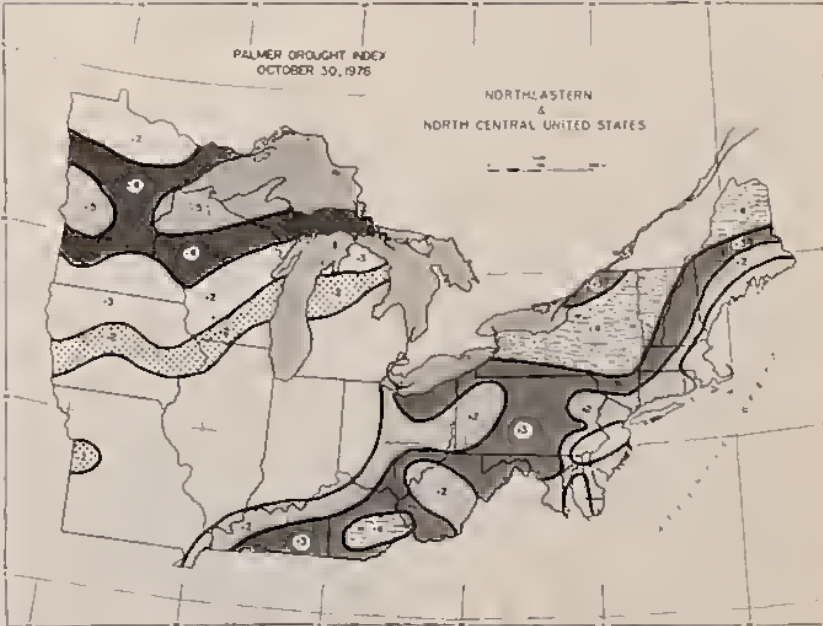


Figure 5

Palmer Drought Index for the Northeastern and North Central United States (July 3 to October 30, 1976.)

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DROUGHT AND FIRE

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fully extinguish. During September the State imposed a 10-county closure on all hunting, fishing, and camping.

Through September 30, 1976, acreage burned on eight National Forests of the Northeast Region was 2.5 times the 1970-74 average. Although man-caused fire frequency increased by only 25 percent, the number of lightning-caused fires increased 200 percent. Most of the larger fires (greater than 1,000 acres) occurred in the Boundary Waters Canoe Area of northern Minnesota.

It was an unusual autumn for wildfire in the Lake States.

Implications

The cool moist climate of the northeastern United States supports forest ecosystems that are extremely sensitive to drought. Rainfall is normally distributed fairly evenly throughout the growing season. If summer droughts extend into early autumn, vegetation, such as sphagnum moss that normally contains sufficient moisture to impede combustion, becomes extremely flammable. Also, annual addition of plant material to the natural fuel bank culminates in early autumn through growth, maturation, and leaf fall.

The suppression of fires burning in drought-conditioned organic soil is formidable and taxes ingenuity. But, if left unextinguished, such fires may break out and become multiple-ignition sources with each passage of a wind-switching weather front. Moreover, unique causes of fire, such as electric fences and farm implement exhausts, usually not considered in fire prevention programs, become primary risks.

Burning conditions induced by prolonged drought are, by definition, persistent. History provides sufficient evidence that droughts similar to the one just experienced in the Lake States have a better than 50 percent chance of continuing through the second year—1977. Fortunately, due to

the nature of drought, the fire manager has adequate time now to prepare for the wildfire activity that invariably accompanies such conditions.

A Palmer Drought Index of less than -2 and trending downward augurs ill for fire managers in the northeast. Frequent monitoring of the Index is advised.

Literature Cited

Haines, Donald A., Von J. Johnson, and William A. Main.

1976. An assessment of three measures of long-term moisture deficiency before critical fire

periods. USDA For. Serv. Res. Pap. NC-131. North Cent. For. Exp. Exp. Stn., St. Paul, Minn. 13p.

Haines, Donald A., and Rodney W. Sando.

1969. Climatic conditions preceding historically great fires in the North Central Region. USDA For. Serv. Res. Pap. NC-34. North Cent. For. Exp. Stn., St. Paul, Minn.

U.S. Department of Agriculture.

1976. Weekly weather and crop bulletin, vol. 63, no. 27. Washington, D.C. 20 p.

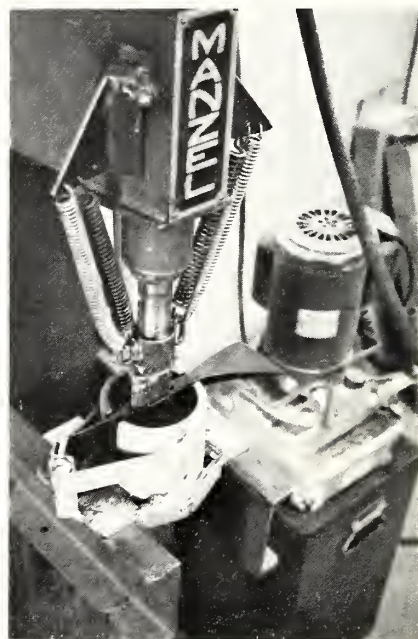


Ax and Pulaski Head Remover and Installer

A new machine is now being used by Region 1 firefighters and is a real timesaver. What was once a difficult job involving a lot of hard work, is now a quick and easy job involving less than a minute to remove an ax or pulaski head and only 1½ minutes to install one. Up to 15 minutes were required in such an operation before this machine was developed.

The new machine is an old bench press which was modified according to a model designed by Forest Service employees Larry Peltier and Tony Jinotti. According to Jinotti, the machine has already been used to remove several hundred pulaski heads.

Drawings and blueprints can be obtained from the Director of Fire and Aviation Management, Forest Service, U.S. Department of Agriculture, Federal Building, Missoula, MT 59801.



COMPUTERIZED FIRE STUDIES

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USFO	MISCELLANEOUS FIRES BY C.O.P. BY MONTH							12/12/75	PAGE 8
SOUTHWEST	UNIT =							YEARS 65-74	
CLASS OF PEOPLE	MAY	JUNE	JULY	AUG	SEPT	OCT	OTHER	TOTAL	
LANDOWNER									
RANCHER-FARMER	1	15	23	17	10	3		69	
FOREST WORKER	1		1	1				3	
PUBLIC UTILITY	7	8	10	11	8	2		46	
RURALIST	4	19	44	33	24	13	1	138	
OTHER		4	4	7	5	2		22	
SUB TOTAL	13	46	82	69	47	20	1	278	
PUBLIC RELATED									
RURALIST		1	1	4	5	4		15	
RECREATIONIST	3	4	11	14	6	2		40	
HUNTER			2			2	1	5	
FISHERMAN	1							1	
MOTORIST		6	10	20	12	1		49	
OTHER	1	14	9	6	9	1		40	
SUB TOTAL	5	25	33	44	32	10	1	150	
TOTAL THIS CAUSE	18	71	115	113	79	30	2	428	
DISTRICT TOTAL	125	253	453	438	300	117	50	1736	

Figure 3.—Sample portion of a District fire study. Distribution of miscellaneous-cause fires by class of people by month.

5. Communication—Regular and free exchange of information among staff, data-processing personnel, and field personnel is necessary to identify problems and emerging trends and to maintain the fire studies that are responsive to prevention program needs.

Interested persons may obtain further information by contacting Dick Rondeau, Protection Division, Oregon Forestry Department, 2600 State Street, Salem, OR 97310.



A New Logo!

The National Wildfire Coordinating Group (NWCG) now has a logo! Acceptance of the logo did not come about with ease—even though the NWCG established only a few simple criteria. The NWCG wanted the logo to depict units of purpose, display fire, and include the name “National Wildfire Coordinating Group.”

After a great deal of interaction, outside kibitzing, and yeoman effort by the artist/illustrator at the National Fire Training Center in Marana, Ariz., the NWCG proudly presents the end product—its own logo.



Do You Have a Young “Fire Bug” in Your Home?

If you live in the forest, do you worry about your children starting fires? You should! Even “nice kids”, like yours and mine, start forest fires. A recent publication by Dr. Bill Folkman, Pacific Southwest Forest and Range Experiment Station, and Drs. Jeanne and Jack Block, University of California, shows that boys, particularly between 3 and 6 years, have a lot more interest in playing with fire than we have assumed.

The research suggests that young children are more likely to “explore” fire out of curiosity rather than to exhibit pathological behavior as with older children who are fire setters.

If “normal children” play with fire, what can we do to prevent forest fires? First, parents can help young children learn how to use fire—carefully. Folkman, et al, found that 25 percent of the parents made no attempt to teach their children about fire. Second, the findings suggest that fire educational programs at home should start early—before the children are 5 years. Most kids are already experimenting with fire by then.

Finally, the authors suggest that “patterns of carelessness and cautiousness, indifference, or concern that people establish as children will largely determine the way they will relate to fire as adults.” So, an ounce of prevention with your children could be worth more than a pound of cure if they become careless adults.

For further details please write to Information Services, Pacific Southwest Forest and Range Experiment Station, P.O. Box 245, Berkeley, CA. 94701. Ask for a copy of USDA Forest Service Research Paper PSW-119, titled *Fire and Children: Learning Survival Skills* by Jeanne H. Block, Jack Block, and William S. Folkman.



Fire Control Makes Use of Lightning Detection

Mary Gillean



Lightning strikes dry timber and dead grass in a remote area of Alaska; a fire begins, burns gradually at first, then builds into a major wildfire causing damage to the tundra and other resources. Expensive manpower and equipment are required to suppress it. This fire got large in spite of detection planes and radar from the Division of Fire Control of the Bureau of Land Management (BLM) working around the clock to spot small fires before they rage out of control.

Lightning Detection Needed

Each year lightning starts about 10,000 forest fires in the continental United States. The lightning fire hazard is particularly serious in remote areas such as Alaska because of the greater difficulty in detecting such fires quickly. Currently BLM uses a network of ground-based radars and detection airplanes to identify the large cloud systems and lightning discharges which might ignite fires. Unfortunately, the conditions which pro-

duce different types of lightning activity are poorly understood. How lightning characteristics relate to cloud structures is not known. Radar can detect cloud build-ups, but not which clouds will produce lightning. Therefore, an electronic system to automatically detect and locate lightning discharges, particularly discharges from cloud to ground, can be a valuable forecasting aid and can greatly increase the effectiveness of existing radar and airplane detection systems.

Such a system, originally developed by the University of Arizona for the National Aeronautics and Space Administration (NASA), is being adapted at BLM's Scientific Systems Development Branch in the Denver Service Center under contract with Dr. Phillip Krieder of the University of Arizona. Two units were installed at Alaska sites during the summer of 1975 to test lightning intensities and compare them with lightning intensity in Florida where the systems were first used.

The results of the tests in Alaska were favorable, and BLM purchased six of the units, which were installed at fire attack stations at McGrath, Galena, Bettles, Fort Yukon, Fairbanks, and Tanacross. The systems

detect cloud-to-ground lightning within a 200 mile radius. Components are portable and compact—consisting of two small antennas, approximately 6 feet long, a receiving unit, and a plotter. A skilled operator is not required as the system is almost completely automatic.

How the System Works

A typical lightning flash consists of several strokes from cloud to ground and return. The detection system uses a simple direction-finding technique which locates cloud-to-ground lightning strokes by measuring the electrical field of the first 100 feet of the return stroke. A plotter then produces a chart that gives the location of the lightning stroke. This directs observers to areas where lightning occurred.

Flying time for detection planes can be greatly reduced by knowing the location of lightning-occurrence areas. This allows more time to concentrate on areas where the probability of lightning fires is greatest, and thus reduce fire detection and suppression costs and protect those resources where losses cannot be measured in dollars.

Ms. Gillean is a writer/editor with the Alaska State Office, Bureau of Land Management, U.S. Department of the Interior, Anchorage, Alaska.



Heated Cover Keeps Slip-On Pumpers Warm

William S. Craig

While the vast majority of the country experiences fire season during the summer when temperatures rarely dip below freezing (except at high altitudes), fire season in the Southeast normally occurs during late fall and early spring when the ground is dry, rainfall is scarce, and temperatures often go below freezing. Freezing temperatures cause truck-mounted pumper units to freeze on cold nights, because many firefighting groups do not have adequate, heated space to permit parking their water-filled pumpers indoors.

Until recently, draining both tank and hoses was the only alternative, and that job was both difficult and time consuming. Any moisture left in the hoses freezes, and the nozzles seal shut.

Solution to Problem

To keep nozzles from freezing, the Andrew Pickens Ranger District of

the Sumter National Forest in South Carolina has developed a heated cover to fit over their 300-gallon slip-on pumper unit. The slip-on units are common in the South and are simply portable tanks with pumps and hoses that "slip" onto a standard pickup truck.

The heated cover, inexpensive and simple to build, rests on top of the pumper and uses only two 60-watt light bulbs for heat. It may seem hard to believe that such a minimal heat source could keep the tanker from freezing but, in testing the unit in 10° F. temperatures, the heat inside the cover was measured at 48° F.

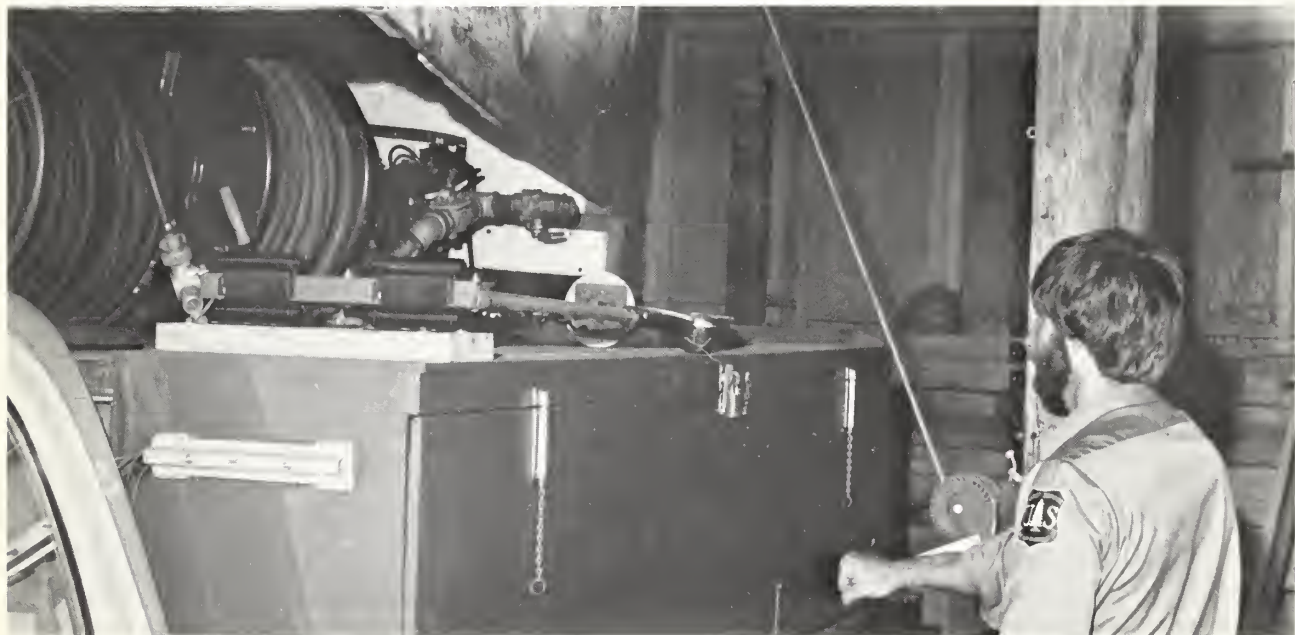
The light bulbs are controlled by a standard household furnace thermostat which is set on its lowest setting of about 55° F.. The cover is large enough to enclose the entire tanker and is hinged at one end to permit the muffler to extend beyond the cover.

Constructed by fire crews on standby, it is made of 1/4-inch plywood

with 1- by 3-inch framing and lined with 1/2-inch styrofoam insulation sheets. The box, which weighs over 100 pounds, is raised and lowered with a simple boat trailer winch and a pulley which are mounted on the roof joists of the open shed where the trucks are parked. One man can perform the operation in only 15 seconds, so the pumper can leave quickly for a fire.

Materials are easily obtainable and, best of all, are very inexpensive. The costs totaled \$72: with plywood, framing, hinges, styrofoam, and a pint costing \$19; winch, cable, chains, and eye bolts costing \$18; and the thermostat, lights, guards, sockets, and wire costing \$35.

Mr. Craig is District Ranger of the Andrew Pickens District, Sumter National Forest, Walhalla, S.C.



An inexpensive boat trailer winch is used to lift the styrofoam-lined and heated cover from a slip-on pumper.

Preplanned Electronic Dispatching An Efficient Approach in Large and Multiple Fire Situations

John Schramel and
Teresa Videtto

Scenario

You are visiting a National Forest somewhere during a period of extreme fire-danger conditions. Fifteen fires are burning simultaneously with one threatening to develop into a large project fire. Fire crews are deployed everywhere, with only one to two crews available for reinforcement. The fire management staff officer is unsure of the location of the helicopter used for scouting, and the District Ranger wants to take an aerial look at the largest fire. The man in the middle of this turmoil is the dispatcher. He is sitting at his desk, which is cluttered with an assortment of maps, telephones, paper, empty coffee cups, overturned card files, microphones, headsets, and magnetic map markers. His eyes are strained, his hands cramped from fatigue, and his mind reeling from too many hours of trying to remember where everybody and everything is.

A Better Way

Large and complex fire situations need no longer be the headache described above. The ingenuity of the fire management staff of the Plumas National Forest in Northern California has resulted in a "better way."

Mr. Schramel is the Fire Training Officer of the Plumas National Forest in Quincy, California. Mrs. Videtto is Public Information Specialist on the Chattahoochee and Oconee National Forests in Gainesville, Georgia.

Through examination of the Forest's fire history, carefully preplanned coordination of fire suppression forces, and the development of an efficient electronic status board, the fire management officers and the dispatchers can be kept constantly aware of the status of all fire suppression units and can be assured of the availability of back-up crews in every part of the National Forest.

A fire history study revealed that certain crews were consistently dispatched to fires in the same general areas, leaving some areas unprotected. This situation was corrected by dividing the Forest into 34 "re-

sponse areas." Factors, such as transportation systems, travel distances by crews going to fires, topography, etc., were used in determining the response areas (fig. 1).

Crews were assigned to these geographic response areas and given the responsibility for both initial attack and reinforcement in that area. This helped to keep the fire suppression effort running smoothly even in hectic situations. Plans were varied according to the fire load—which is based on fire occurrence, intensity, and large-fire potential.

Even an efficient dispatching system such as this can not provide much



Figure 1.—The Plumas National Forest has been divided into 34 "response areas."

help to the harried dispatcher who is using manually operated status boards, manning sheets, and card files. The status of all available units remain an exercise in memory and manual dexterity for each dispatcher. Obviously, an improved visual display was called for in order to coordinate the fire suppression effort more efficiently.

Electronic Manning Board

Plumas National Forest dispatchers, on detail to southern California Forests, noticed an electronic manning board in use there and were impressed by the device's potential. This manning or status board simply listed the names of the crews and showed, by a light, their availability for dispatch. A separate pair of toggle switches operated each light.

Plumas dispatchers, however, went home with an idea of how they wanted their status board to operate. They outlined their requirements and had the board designed under a contract.

The finished board (fig. 2), is 46 by 118 inches (117 by 300 cm) in size and displays all fire suppression resources available on the Forest. This includes suppression personnel, air units, lookouts, fire overhead, and zone resources. Each of the 10 divisions on the board contains room for 20 crews to be displayed. The crew names are coded by colored magnetic strips to indicate their function. For example, all fire prevention personnel are shown in yellow, District Rangers and fire management officers in white, ground tankers and crews in red, and heavy equipment in blue. Other colors can be added if necessary.

Four lights are located next to each crew or unit name shown on the board. The first light (red) indicates that the crew is not available for dispatch. The second (green) indicates the crew is within its area of responsibility and available to respond. The third (white) signifies that the unit is responding to a fire, while the fourth (also red) shows that the unit is on a



Figure 2.—The manning board displays all fire suppression resources on the National Forest.



Figure 3.—The manning board lights are controlled from a console located at the dispatcher's desk.

fire. The unit's regular day off is shown by extinguishing all four lights.

The lights are controlled from a console located at the dispatcher's desk, which is facing the status board (fig. 3). The dispatcher codes the status board by punching the crew's radio call number on the numerical key bank on the left and the desired status code on the right key bank of the console.

In addition, the console has been programmed to coordinate automatically the proper units with their preplanned response area. Under automatic dispatch conditions, the dispatcher alerts the Forest by radio, announces the area of response and whether the response level is light or heavy. He then enters the response area's number on the console along with the appropriate status code. The console automatically turns on the

white light for the responding crew, which has the initial attack responsibility, and begins flashing the green lights for the appropriate back-up crews—each of which was determined during the fire planning process. If an assigned unit is unavailable for response, the console is programmed to start flashing the crew's white light alerting the dispatcher to a non-response.

This preplanned dispatch system enables the dispatcher to know, in advance, which forces he will send to each area of response in a given situation and which forces are to be used for back-up in that particular area. The electronic status board helps the dispatcher use preplanned dispatching to its fullest advantage. It has made dispatching on the Plumas National Forest more efficient.



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Recent Fire Publications

Abbott, N.J. and S. Schulman.

1976. Protection from fire: non-flammable clothing—a review. *Fire Technol.* 12(3): 204–218. NFPA, Boston, Mass.

Adams, Thomas C.

1976. Economic availability of logging residue in the Douglas-fir region. USDA For. Serv. Res. Pap. PNW-64. Pac. Northwest For. Range Exp. Stn., Portland, Ore. 9 p.

Adams, Thomas C., and Richard C. Smith.

1976. Review of the logging residue problem and its reduction through marketing practices. USDA For. Serv. Res. Pap. PNW-48. Pac. Northwest For. Range Exp. Stn., Portland, Ore. 22 p.

Bare, B. Bruce, and Brian F. Anholt.

1976. Selecting forest residue treatment alternatives using goal programming. USDA For. Serv. Res. Pap. PNW-43. Pac. Northwest For. Range Exp. Stn., Portland, Ore. 26 p.

Bare, B. Bruce, Benjamin A. Jayne and Brian F. Anholt.

1976. A stimulation-based approach for evaluating logging residue handling systems. USDA For. Serv. Res. Pap. PNW-45. Pac. Northwest For. Range Exp. Stn., Portland, Ore. 30 p.

Eastman, John

1976. Lure of the burn. *Natl. Wildl.* 14(5):10–11.

Fechner, Gilbert H., and Jack S. Barrows.

1976. Aspen stands as wildfire fuel breaks. Eisenhower Consortium Bull. 4. Colo. State Univ., Ft. Collins. 26 p.

Matthews, R.P.

1976. Use of prescribed burning to enhance regional air quality. *In* Emissions from forest burning. Presented at 69th Annu. Meet. Air Pollut. Control Assoc. June 27–July 1, 1976. Portland, Ore.

Moore, William R.

1976. Fire! *Natl. Wildl.* 14(5):4–9.

Nicholls, Gregory M.

1976. Wildfire: the story of forest fire control in Manitoba. Manitoba Dep. Nat. Resour. Transp. Serv., Winnipeg, Manitoba.

Niederleitner, J.

1976. A pocket fire-size estimator for aerial observers. *Can. For. Serv. Res. Pap. NOR-X-157.* North. For. Res. Cent. Edmonton, Alberta.

Parker, J. Louise.

1976. Studying fire in the interior. *In* Forestry research: what's new in the West. April 1976. USDA For. Serv. p. 5–7.

Pickford, Stewart G. and David V. Sandberg.

1975. Using motion pictures for data collection on prescribed burning experiments. USDA For. Serv. Res. Note PNW-259. Pac. Northwest For. Range Exp. Stn., Portland, Ore. 7 p.

Pong, W.Y., and John W. Henley.

1976. Characteristics of residues in a balloon logged area of old-growth Douglas-fir. USDA For. Serv. Res. Note PNW-272. Pac. Northwest For. Range Exp. Stn.,

Portland, Ore.

Ryan, P.W. and C.K. McMahon.

1976. Some chemical and physical characteristics of emissions from forest fires. *In* Emissions from forest burning. Presented at 69th Annu. Meet. Air Pollut. Control Assoc. June 27–July 1, 1976. Portland, Ore.

Tangren, Charles D.

1976. Smoke from prescribed fires. *For. Farmer* 35(10):6–7.

Wade, Dale D., and Darold E. Ward.

1975. Management decisions in severely damaged stands. *J. For.* 73:574–577.

Ward, D.E., C.K. McMahon, and R.W. Johansen.

1976. An update on particulate emissions from forest fires. *In* Emissions from forest burning. Presented at 69th Annu. Meet. Air Pollut. Control Assoc. June 27–July 1, 1976. Portland, Ore.

Ward, Franklin R.

1975. Evaluations on accelerating wood decomposition in the field. USDA For. Serv. Res. Note PNW-245. Pac. Northwest For. Range Exp. Stn., Portland, Ore. 8 p.

Wolfe, Terry.

1976. Prescribed burning: prescription for prairies management. *The Minnesota Volunteer* 39 (227): 31–32, 37–38. Minn. Dep. Nat. Resour., St. Paul, Minn.

Zehring, Bob, and Allan D. Childers.

1976. Air tankers get drop on wildfires. *Fire Eng.* 129 (3): 38–39.

